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COSTA RICAN DIPTERA

COLLECTED BY PHILIP P. CALVERT, PH.D., 1909-1910

Paper 3.—A Report on the Ephydriidae

BY E. T. CRESSON, JR.

The general introductory remarks relative to this series already have been given, and will be found in the first paper.¹ Included in that introduction is a list of the localities where the material was collected, prepared by Dr. Calvert, consisting of brief descriptions of the topography and the general surrounding conditions of the localities visited.² Dr. Calvert collected this material between May 14, 1909 and May 1, 1910.

The present paper treats of the species of the acalyptrate family Ephydriidae. The material is especially rich in this group, comprising over one hundred and thirty specimens, representing twenty-eight genera and fifty-seven species. Two new genera and twenty-two new species are introduced and described. The species of this family are most easily collected by sweeping, especially near and over mud or water which may be in stagnant or fresh pools, in running brooks or at the shores of creeks, rivers or oceans. Rarely are they found in pasture or dry woods. It is the endeavor of the writer, in this paper, to present a preliminary synopsis of, or a guide to, the species of this group of Diptera that may be found in Costa Rica. The work is by no means exhaustive in its treatment of the ephydrid fauna, for it will take much more thorough collecting than Dr. Calvert was able to do, to give us anywhere near the number of species which occur in that region so rich in its insect fauna. The types of the new species are in the collection of the Academy of Natural Sciences of Philadelphia.

The engagement of the author in a revisionary study of the Ephydriidae of North and South America, makes it possible for him to offer this paper in its present form. Prior to this writing

¹ Trans. Am. Ent. Soc., xl, p. 1, 1914.

² A full account of Dr. Calvert's sojourn in Costa Rica is published by The Macmillan Company, New York, "A Year of Costa Rican Natural History" by A. S. & P. P. Calvert, and full notes on his collecting may be found therein.

there has been practically no work done on the Central American species, instead only isolated descriptions of new forms. Consequently the literature gives very little trouble. Furthermore, the writer has examined the types of most of the known species occurring, or likely to occur, in Costa Rica. In view of the forthcoming revision of the American Ephydriidae, of which two papers have already appeared,³ the species in the present paper are not as fully treated as they otherwise would have been. However, the descriptions of the new forms are full enough to enable the student to recognize them, and pertinent notes are given on most of the others, while analytical tables, where possible, are given of all the forms treated.

This family, as with the majority of the Acalyptratae, includes species most of which are so small, that a microscope is necessary for their thorough study. In consequence it will not be a very inviting study to many; although the field offers more opportunities for real constructive work than many other groups possessing larger individuals. The writer makes constant use of a Zeiss binocular microscope, with a combination giving a magnification of about forty-five diameters, with an occasional use of a higher power.

As to the systematic limits of the family, little can be said, for much exhaustive study will be necessary before the families of the Acalyptratae can be thoroughly understood. However, the species of this family, as here understood, may be recognized by the structure of the head, especially of the face. There are no vibrissae or vibrissal angle or ridge; the parafacials (the areas next to the eyes), parafacial ridges and groves are never converging below, but always extending posteriorly and ending at the lateral oral margin; the mesofacial area is always convex, sometimes greatly swollen, at most with only a weak carina, except between the antennal foveae in some species. There is usually a series of bristles on each side of the face, which below are concentric with the orbits, while above they may continue so, or, may converge, crossing the face and become contiguous. In the latter case the mesofacial area is prominent and setulose (characteristic of the subfamily Ephydrinae). The auxiliary vein

³ Trans. Amer. Ent. Soc., xlii, 101-124, 1916 (*Paralimna*). Trans. Amer. Ent. Soc., xliii, 27-66, 1917 (*Notiphila* and *Dichaeta*).

normally coalesces with the first near its extremity, and the discal and second basal cells are rarely separated.

The species seem to merge nicely with some *Drosophilids*, but the latter have a more or less distinct vibrissae. On the other hand some seem to simulate the *Borboridae*, but the short basal joint of the hind tarsi will distinguish the members of that family. In the *Geomyzidae* there is a distinct vibrissal angle and bristle. With the exception of a few genera, for instance—*Brachydeutera*, *Ochthera*, *Psilephydra*, *Canace* and *Planinasus*, the species are very constant, with the above family characteristics well emphasized. The genus *Planinasus* is probably marginal in its position, possibly a representative of another family.

*Analytical Table of the Genera occurring or likely to occur in
Costa Rica*

1. Discal and second basal cells separated by a cross vein; cheeks with one or more upcurved bristles. (Maritime species. Neotropical ?) . . . **Canace**
Discal and second basal cells not separated; cheeks with or without a ventro-proclinate bristle 2
2. Fore femora greatly dilated; third and fourth veins converging . . **Ochthera**
Fore femora not thickened; third and fourth veins parallel or diverging . . 3
3. Face below broad, prominent, setulose; mouth large, vaulted; frontal bristles curving laterally over eyes 4
Face broad, prominent, convex and swollen, not setulose, with no distinct bristles or orbital area; mouth rather narrow; no distinct frontal bristles; antennae small with very long, nearly bare arista **Psilephydra**
Face not setulose medianly, with only a series of one or more bristles on each side 6
4. Costa extending to fourth vein 5
Costa not reaching fourth vein **Scatophila**
5. Claws generally long, nearly straight; pulvilli minute **Ephydra**
Claws small, curved; pulvilli well developed **Scatella**
6. Middle tibiae with two or more erect extensor bristles 7
Without such bristles 8
7. Costa extending to fourth vein **Paralimna**
Costa not attaining fourth vein **Notiphila**
8. One or more distinct dorso-central bristles (exclusive of the prescutellar pair) 9
No dorso-central bristles 12
9. Eyes pilose; facial bristles hair-like 10
Eyes bare; facial bristles strong 11
10. Frontal bristles absent; face prominent below **Nostima**
Frontal bristles present; face not produced **Hydrellia**

11. Face opaque, with nose-like tubercle between antennal foveae; wings spotted **Ilythea**
 Face shining, evenly convex, without nose-like tubercle; wings not spotted, hyaline **Typopsilopa**
12. Face very short; mouth large, with margin anteriorly attaining the nose-like tubercle between the foveae; opaque brown species with contrasting, silvery pleura **Brachydeutera**
 Face large, prominent below, without tuberculous swelling; epistoma scarcely retreating **Napaea**
 Face evenly convex or more or less tuberculate; epistoma generally retreating 13
13. Abdomen broad, circular in outline; face with a median, prominent, semi-globose swelling; black, shining species **Gastrops**
 Abdomen ovate 14
14. First three abdominal segments together not longer than fourth, with flattened depressed area on dorsum **Lytogaster**
 Abdomen normal 15
15. All head and thoracic bristles reduced to setulae, or wanting; antennae retained in pit-like foveae. (Neotropical?) **Mosillus**
 At least vertical and scutellar bristles well developed 16
16. Third antennal joint elongate, decumbent; spine weak or wanting. (South America and West Indies) **Ceropsilopa**⁴
 Third joint short, or, if elongate, spine well developed 17
17. Facial bristles strong; third antennal joint lenticular 20
 Facial bristles strong; third antennal joint elongate 18
 Facial bristles hair-like; third joint short 22
18. Face with two pairs of bristles. (South America.) ? **Clasiopella**
 With only one pair 19
19. Frons and face oblique, in same plane; face most prominent at epistoma. **Plagiops**
 Frons and face convex in profile; epistoma retreating **Psilopa**
20. Mesonotal setulae in distinct series 21
 Setulae scattered, not seriated **Discocerina**
21. Third costal section at least equal in length to second; wings noticeably pointed at tip of third vein **Atissiella**
 Third costal section at most one-half as long as second; wings not pointed. **Allotrichoma**
22. Face evenly sculptured in distinct transverse furrows. (South America.) **Cerometopon** Cresson⁵
 Face at most minutely pitted on the facalia **Ochtheroidea**

⁴ *Ceropsilopa* Cresson. Described in Ent. News, xxviii, 340, 1917.

⁵ Ent. News, xxv, 241, 1914.

NOTIPHILA

1823. Fallen, Dipt. Suec. Hydromyz., 7.

Here we have a genus not easily confused with any other. The costa extends to, or only slightly beyond, the tip of the third vein, never attaining the fourth. The middle tibiae have three or four erect bristles on their extensor surfaces. The face is flat or gently convex, at most but slightly prominent in profile. The middle femora of some males are noticeably ciliate beneath.

Three species are recognized from Costa Rica.

Table of Known Central American Species

- | | |
|---|-------------------|
| 1. Middle tibiae with three extensor bristles; facial bristles confined to lower half. (<i>Notiphila</i>)..... | 2 |
| Middle tibiae with four extensors; facial bristles in series extending to foveal region; frons and mesonotum distinctly striped. (<i>Agrolimna</i>).. | frontalis |
| 2. Mesonotum distinctly striped, at least with a broad lateral stripe..... | 4 |
| Mesonotum not so striped..... | 3 |
| 3. Abdomen with two series of large, triangular spots, which attain apices and lateral margins of segments. (Cuba)..... | fulvimana |
| Abdomen with two or four series of small spots..... | erythrocer |
| 4. Face with a median brown stripe. (Panama)..... | facialis |
| Face immaculate..... | virgata |

Notiphila erythrocer Loew Pl. III, fig. 1, 2.

1878. *Notiphila erythrocer* Loew, Zeit. f. Ges. Naturw., li, 194.

This seems to be the representative species of the northern neotropical countries. It may be best recognized by the broad face, pale second antennal joint, broad face with one to three well developed bristles each side and the immaculate, or at most faintly vittate, mesonotum. The general color is ochreous; even the browns and the dark areas are overcast with this color. The females should not be confused with those of *virgata*, which have the browns of the abdomen more or less shining and the mesonotum distinctly vittate.

The species was described from Cuba. It is represented by fifty-eight specimens, collected by sweeping over mud at the following localities: Alajuela, September 15; Bonnefil Farm, Rio Surubres, October 21; Cartago, December 12 to May 17; Laguna, near Cartago, February 26; El Alto, July 7; Filadelfia, Rio Tempisque, January 18; Guacimo, May 6; Juan Viñas, July 30; Peralta, August 7 and March 24; Turrucare, December 22.

Notiphila virgata Coquillett

1900. *Notiphila virgata* Coquillett, Proc. U. S. Nat. Mus., xxii, 259.

This species, in the male, has the middle tibiae distinctly ciliate with comb-like series of short bristles. The antennae are mostly pale, the mesonotum distinctly vittate, and the abdomen with four series of brown spots. It is very distinct from *erythrocer*a, and in general easy to distinguish, although the vittate individuals of that species are often confusing. The females may, on the other hand, be confused with the recessive forms of *facialis*.

Originally described from Porto Rico. Twenty-five specimens were collected, mostly over mud, from the following localities: Alajuela, September 8; Cachi, near Rio Reventazon, March 4; Cartago, February 19 to May 17; Juan Viñas, February 14; Peralta, March 24.

Notiphila frontalis Coquillett

1904. *Notiphila frontalis* Coquillett, Proc. Ent. Soc. Wash., vi, 97.

In this species the frons especially, and the mesonotum, are distinctly vittate. The frontal stripes are velvety black, the orbits and face being golden yellow. The broad abdominal bands attain the apices of the segments medianly. This is a pretty and well marked species, probably a neotropical representative of the northern *pulchrifrons* Loew.

Originally described from Nicaragua, and represented in our material by eleven specimens: Banana River, November 9; Cartago, February 19 to May 17; Turrucare, December 22.

PARALIMNA

1862. Loew, Mon. Dipt. N. Am., i, 138.

This genus is well represented in Costa Rica. The species, however, are difficult to determine, and my recent revision of this genus should be consulted by the student who desires to become more acquainted with the species. In this paper I will give only a table of the species known to occur in Costa Rica, with a list of the material examined and some pertinent notes. The genus is characterized by the presence of three extensor bristles on the middle tibiae and the continuation of the costa to the fourth vein.

Table of Costa Rican Species

1. Pleura and venter more or less cinereous, contrasting with the dorsum; face large, swollen and prominent 2
 The entire thorax and venter, dark, unicolorous; face less prominent.
 Opaque species. **decipiens**
 Shining species. **obscura**
2. Second antennal joint with a flattened, mostly silvery, area above at apex . . 3
 Second joint normal, without such area 4
3. Frons horizontal; face dark **puncticornis**
 Frons convex; face white **argyrostoma**
4. Fore femora of males more or less constricted beneath on apical third, and with a mesal series of curved, flattened bristles; females with face sericeous, light in color. **ciliata**
 Fore femora normal; face gray to brown. 5
5. Face, except foveae and parafacials, entirely dark brown. . . **brunneiceps**
 Face mostly cinereous or yellowish brown **meridionalis**

***Paralimna (Phaiosterna) decipiens* Loew**

1878. *Paralimna decipiens* Loew, Zeit. f. Ges. Naturf., 1878, 195, [Texas].

1916. *Phaiosterna decipiens* Cresson, Tr. Amer. Ent. Soc., xlii, 108.

This and the following form constitute a group, which I have given the subgeneric name of *Phaiosterna*. They are separated from the other species by the absence of any decided gray or white dusting. The abdominal segments may have olivaceous tinged bands, but no other parts are so marked, at least not with gray or white.

In this species the variation in the amount of opacity or pruinosity, and in the color of the same, ranges from dark brown to golden brown. The light abdominal bands are sometimes so broad that they occupy the entire segment. Abraded specimens may have the thorax shining, so that there is some danger in confusing these with the next species, therefore care should be used in determining such material.

The species is well distributed in Neotropical North America.

Sixteen specimens were collected from the following localities: Muddy bank of Rio Tempisque, Filadelfia, January 18; Santa Cruz, Rio de la Cañas, January 30; Along ditch in Cartago, May 25 and July 4.

***Paralimna (Phaiosterna) obscura* Williston**

1896. *Paralimna obscura* Williston, Tr. Ent. Soc. London, 1896, 391, [St. Vincent].

1916. *Phaiosterna obscura* Cresson, Tr. Ent. Am. Ent. Soc., xlii, 109.

This is not considered a very well defined species. The typical specimens, however, are easily determined by the total absence of pollinose surfaces, except perhaps on the face and pleura. There may be faint dustings of pollen but never so as to obscure the shining surfaces.

This form is known to range south to Paraguay. Three specimens were collected in Costa Rica at the following localities: Muddy bank of Rio Tempisque, Filadelfia, January 18; Santa Cruz, Rio de la Cañas, January 30.

Paralimna ciliata Cresson Pl. III, fig. 4.

1916. *Paralimna ciliata* Cresson, Tr. Am. Ent. Soc., lxii, 111.

A species belonging to a group in which the males have the fore femora distinctly ciliate beneath with flattened, curved hairs. The females are difficult to separate from those of *meridionalis*, but the face here is sericeous, light gray or yellowish to nearly white.

Described from Costa Rica and is represented by twelve specimens: Near upper reservoir, Banana River, November 9; Over mud, Cartago, October 27 to January 3; Over mud on southern slope of Irazú, north of Cartago, December 15.

Paralimna meridionalis Cresson Pl. III, fig. 3.

1916. *Paralimna meridionalis* Cresson, Tr. Am. Ent. Soc., xlii, 119.

This species seems to represent *appendiculata* in the Neotropical Region. It ranges from Guatemala to Argentina, while *appendiculata* ranges northward. It is possible that *appendiculata* will be found in Costa Rica. The present species is the one likely to be most abundant in the neotropics and is distinguished by the general dark color; the face is dull gray, not sericeous, with the usual three dark dashes of brown or yellow. The legs are not furnished with any peculiar bristles, but the fore femora are ciliate with closely set bristles.

Originally described from Costa Rica and represented by thirty specimens: Alajuela, September 15; Upper Reservoir, Banana River, November 9; Stagnant pool on bank of Rio Réventazon, Cachi, March 10; Cartago, July 4 to December 12; Irazú Volcano, December 15; La Carpentera, December 4; Bonnefil Farm, Rio Surubres, October 21; Turrucares, December 21.

Paralimna brunneiceps Cresson

1916. *Paralimna brunneiceps* Cresson, Tr. Am. Ent. Soc., xlii, 120.

A species in general similar to *meridionalis*, but the face, with the exception of the orbits and foveae, is evenly dark brown. It may prove to be only a variety of that species.

Originally described from Costa Rica and represented by ten specimens: Alajuela, September 8 to 15; Rio Siquiares, December 19; Turrucare, December 22; Bonnefil Farm, Rio Surubres, October 21.

Paralimna argyrostoma Cresson

1916. *Paralimna argyrostoma* Cresson, Tr. Am. Ent. Soc., xlii, 120.

This well marked species, known only from Costa Rica, has the face silvery white and the general body color olivaceous, not brown, and a silvery spot on the upper apical angle of the second antennal joint. This should not be confused with the next species.

Eight specimens collected: Near upper reservoir, Banana River, November 9; Rio Aranjuez, Puntarenas, September 15, 1905, (F. Knab), [U. S. N. M.].

Paralimna puncticornis Cresson

1916. *Paralimna puncticornis* Cresson, Tr. Am. Ent. Soc., xlii, 121.

This species also has the silvery spot on the second antennal joint, but is darker than the preceding, more brownish, not greenish, and the face is dark, hardly grayish. It has the frons rather horizontal, but the eyes are round and large.

It is known to range south to Colombia. Only one specimen seen from Costa Rica: Peralta, March 24.

HYDRELLIA

1830. Desvoidy, Myod., 730.

A genus closely resembling *Notiphila* in general characters, but the species are much smaller, with pilose eyes; the costa extends to fourth vein, and the middle tibiae are not possessed of the characteristic extensor bristles.

The species known from Costa Rica may be separated as follows:

Palpi black.

Only one dorso-central, excluding prescutellar pair; frontal stripes velvety black; face densely silvery-white.....**tibialis**

Two such bristles; face dull ochreous to black**calverti**

Palpi yellow.

Second antennal joint of male with distinct spine; fore femora of female with series of blunt spines on inner flexor margin.....**spinicornis**

Without such characters.....**hypoleuca**

Hydrellia tibialis Cresson

1917. *Hydrellia tibialis* Cresson, Ent. News, xxviii, 341.

This species is easily distinguished by the characters given in the table of species. The Costa Rican specimens seem to be identical with the type, although perhaps slightly more shining and somewhat smaller.

Represented by two specimens, collected over mud in Cartago, December 12.

Hydrellia calverti new species

Black; extreme bases of tarsi pale; halteres lemon yellow. Wings hyaline. Shining, metallic green. Frontal stripes opaque, black. Lunule and face opaque, sericeous, ochreous to black. Pleura grayish. Femora brownish. All tibiae silvery on outside.

Face roundly carinated above, slightly swollen below; twice as long as broad, with two to four bristles on each side. Mesonotal bristles strong; dorso-centrals 1: 1. Middle tibiae not enlarged. Second costal section slightly longer than third. Length.—1.5 mm.

Type.—♂; Bonnefil Farm, Rio Surubres, Costa Rica, October 20, 1909, (sweeping at 800 ft. alt.), [Type No. 6120].

Hydrellia spinicornis new species Pl. III, fig. 5.

In general respects similar to *hypoleuca* Lw.

Black; palpi, joints of femora and tibiae and bases of tarsi, pale. Halteres yellowish white. Wings subhyaline, brownish with black veins. Opaque; mesonotum, scutellum and abdomen somewhat shining. Dorsal surfaces brownish pollinose. Face and lunule white; occiput below, pleura, venter, femora, and tibiae light gray.

Face flat or slightly convex below, with five to seven bristles on each side. Antennae of male with second joint distinctly produced at angle and furnished with distinct spine. Dorso-centrals arranged 0: 1; near suture. Fore femora of female with series of minute, blunt spines on apical portion of inner flexor margin. Length.—2.25 mm.

Type.—♂; Alajuela, Costa Rica, September 15, 1909, (sweepings at 3100 ft. alt.), [Type No. 6121]. *Paratypes*.—1 ♂, 1 ♀; topotypical.

Another female, along ditch at Cartago, May 17, also belongs here.

Hydrellia hypoleuca Loew1862. *Hydrellia hypoleuca* Loew, Mon. Dipt. N. Am., i, 151.1862. *Hydrellia scapularis* Loew, Mon. Dipt. N. Am., i, 152.

I cannot separate the Costa Rican specimens specifically from those found in the United States. The species is very variable, and probably is a variety of the European *griseola*. The color of the face ranges from white to yellow or golden, and perhaps specimens will be found with it nearly black, as in variety *obscuriceps* Loew.

The above synonymy is suggested and is probably correct. The form with yellow face has been described as *scapularis*.

The species is represented by seven specimens: Over mud at Cartago, May 17, July 4, and November 21; Laguna del Dirumbo, southern slope of Irazú, July 13.

NOSTIMA

1900. Coquillett, Can. Ent., xxxii, 35.

Closely allied to *Philygria*, if not congeneric. The only constant character I can find is the presence of but two pair of dorso-centrals, and generally the arista has long hairs above.

Two species are known from Costa Rica, and may be separated as follows:

Wings hyaline; legs entirely pale. **immaculata**
 Wings blackish, marked with numerous rounded white spots; legs spotted. **slossonae**

Nostima slossonae Coquillett Pl. III, fig. 15.1900. *Nostima slossonae* Coquillett, Can. Ent., xxxii, 35, (Florida).1914 *Philygria calverti* Cresson, Ent. News, xxv, 274, pl. x, f. 2, (Costa Rica).

This is the prettiest species of the genus, and cannot be mistaken when once seen. The conspicuously marked wings and the gray spotted mesonotum and abdomen are very characteristic.

Represented by two specimens: Alajuela, September 15, and Juan Viñas, April 28 (at brook near woods).

Nostima immaculata new species

This species may be easily distinguished by the opaque, immaculate frons and mesonotum, shining abdomen and immaculate wings.

Black, face medianly, antennae except upper margin of third, palpi, halteres and legs, yellow.

Opaque; abdomen, especially segments four to six polished. Frons and mesonotum brown. Face and cheeks yellow or grayish; occiput and pleura cinereous; facial orbits, apical margin of third and apical spot on fifth abdominal segment, silvery.

Face vertical, lower part convex, scarcely prominent. Cheeks broad as third antennal joint. Arista with eight long hairs above. Abdominal segments four and five subequal in length. Wings hyaline, immaculate with costal sections two and three subequal; penultimate section of vein four twice as long as posterior cross vein. Length.—1.25 mm.

Type.—♂; Bonnefil Farm, Rio Surubres, Costa Rica, October 20, 1909, (sweeping, 800 ft. alt.), [A. N. S. P. No. 6122].

A topotypical female in poor condition shows three apical silvery spots on segment four and one or three on five. There may be similar spots on two and three.

ILYTHERA

1839. Haliday, An. Nat. Hist., iii, 408.

This genus is well characterized by the broad face with its nose-like carina, and the spotted, thick veined wings. The species should not be confused with those of *Scatella* with similarly marked wings. The genus is well represented in Costa Rica, and the known species may be separated as follows:

1. Second costal section more than three times as long as third; veins two and three parallel; femora black **caniceps**
 Second costal section not twice as long as third; veins two and three markedly divergent; femora mostly pale 2
2. Wings with four brown spots in first posterior cell, excluding costal cloud. **calverti**
 First posterior cell with only three spots 3
3. Wings with two brown spots between apices of veins two and three. **fenestralis**
 Wing with but one spot between these veins.
 Abdomen shining, jet black **flavipes**
 Abdomen subopaque, brownish **obscura**

Ilythera caniceps new species

Similar in structural and most color characters to *spilota* Curtis, which I have seen from North America. It differs, however, in the frons being shorter and broader in proportion; face narrower and longer and white or nearly silvery, wholly or nearly so, at least the orbits always silvery. This color is seen when viewed from above, the upper face and tubercle remaining brownish. The mesonotum and scutellum are more metallic; the abdomen shining with

rather faint bluish tinge; knees, tibiae, and tarsi, except apices, pale. Length.—2 to 2.3 mm.

Type.—♂; Cartago, Costa Rica, May 25, 1909, (along ditch), [Type No. 6175]. *Paratypes*.—1 ♂, 2 ♀, topotypical.

Also represented by seven specimens collected May 17, over ditches in Cartago and June 15, over mud on the southern slope of Irazú near the road to the crater.

Ilythea calverti new species

A species distinguished by the short second vein and the large roundish hyaline spots in the wing.

Black; antennae except bases and apices, mouth parts, legs including coxae, and halteres, yellowish. Shining, more or less metallic tinged, especially the mesonotum and frons. Wings infuscated with large, round, white or hyaline spots between the veins. Face sparingly yellowish, sericeous; polished above the hump. Thorax and abdomen sparingly golden. Second and third costal sections subequal. Marginal cell with two, submarginal with one, and first posterior cell with four, isolated brown spots. Length.—1.5 mm.

Type.—♀; Filadelfia, Costa Rica, January 18, 1910, (muddy beach of Rio Tempisque), [Type No. 6123].

Another female from Juan Viñas, April 28, collected at a brook near woods.

Ilythea fenestralis new species Pl. III, fig. 21.

Similar to *calverti*, but the hyaline areas are much broader and more quadrate than the infuscated interspaces, and arranged more or less to form fasciae across the wings.

Black; antennae, mouth parts, halteres, legs, and sometimes face below, tawny. Shining above, sparingly brown pruinose below. Frons and mesonotum, and scutellum strongly tinged with metallic blue and purple. Face white and brown, sericeous. Cheeks as broad as antennae. Wings with venation and maculation as figured. Length.—1.5 to 2 mm.

Type.—♂; Cartago, Costa Rica, May 25, 1909, (along ditch), [Type No. 6124].

Also represented by three specimens: Guacimo, June 6, and over mud at Turrucare, December 22.

Ilythea flavipes Williston Pl. III, figs. 19, 20.

1896. *Ilythea flavipes* Williston, Trans. Ent. Soc. London, 1896, 403.

Although I am not absolutely certain that the series before me belongs to this species, there is very good reason to think it will prove to be such. The species, as we understand it, may be readily distinguished by the characters given in the table of species.

The species was originally described from St. Vincent, West Indies. It is here represented by a good series of sixteen specimens, collected on the muddy beach of Rio Tempisque, Filadelfia, January 18.

Ilythea obscura new species

Similar to *flavipes* but more opaque; the yellowish dust being denser, and the abdomen subopaque, olivaceous and dusted with brown; not polished and jet black. The wing maculation is the same as in that species.

Type.—♂; Filadelfia, Costa Rica, January 18, 1910, (muddy beach of Rio Tempisque), [Type No. 6125]. *Paratypes*.—2♂, topotypical.

Also a male belonging here, from Banana River, November 9.

PSILOPA

1823. Fallen, Dipt. Suec., Hydrom., 6.

The species of this genus are mostly shining black, rarely pale in color, destitute of dense pruinose vesture. The face is evenly convex, retreating below, rarely and only weakly foveolate, with only one facial bristle. Antennae with strongly developed spine on second joint, and third usually distinctly longer than broad. Mesonotum with setulae arranged in well defined rows, and no dorsal bristles except the usual prescutellar pair.

The species should not be confused with those of *Ochtheroidea* and other allies near *Discocerina*. They may, however, be somewhat difficult to separate from those of the closer allied genera, as *Clasiopella* and *Typopsilopa*. Of the genus *Psilopa*, as here restricted, there are only two species known from Costa Rica, but no doubt others occur there. These two may be separated as follows:

Fore coxae, middle and hind tibiae, pale, fore femora black; face narrow and transversely wrinkled **willistoni**

Fore coxae and all femora and tibiae black; face broad and highly polished. **meridionalis**

Psilopa meridionalis new species

Black; antennae except apices of third joint, knees, apices of tibiae and basal joints of tarsi, pale. Wings yellowish or whitish, blackened at extreme base, iridescent, with yellow veins.

Shining, more or less metallic tinged. Face highly polished, evenly convex, with bristles below middle of profile. Mesonotum faintly sculptured. Second and third costal sections subequal. Length.—2.8 to 3 mm.

Type.—♂; Cartago, Costa Rica, May 17, 1909, (along ditch), [Type No. 6126]. *Paratypes*.—3 ♂, 1 ♀, topotypical.

Six specimens were also collected from the following localities: Cartago, July 4; Laguna de Ochomogo, El Alto, July 4; Near brook Toyogres, southern slope of Irazú, April 6.

This species is probably the neotropical representative, or a subspecies, of the northern *aeneonigra* Lw.

***Psilopa willistoni* new name**

1896. *Psilopa nigrimana* Williston, Tr. Ent. Soc. London, 1896, 393 [nec *Notiphila* (*Ephygrobia*) *nigrimana* v. Ros., 1861].

This species belongs to a group comprising species which have the fore tarsi somewhat dilated and always black; the face is narrow, transversely convex and more or less rugulose, with the bristles situated near the middle of the profile. The present species is recognized by the yellow fore coxae, black femora and immaculate wings.

Two specimens were collected on the muddy beach of Rio Tempisque at Filadelfia, January 18.

The synonymy of *nigrimana* is possible on account of the synonymy of the genera *Psilopa* and *Ephygrobia*. This situation necessitated the creation of a new name for Williston's species.

TYPOPSILOPA

1916. Cresson, Ent. News, xxvii, 147.

Allied to *Psilopa*, but with two pairs of well developed dorso-central bristles, exclusive of the usual precutellar pair.

***Typopsilopa flavitarsis* Cresson** Pl. III, fig. 7.

1916. *Typopsilopa flavitarsis* Cresson, Ent. News, xxvii, 147, (Arizona).

Very similar to *Psilopa atra* Loew of the United States which belongs to this genus, but the frons is very much obscured, causing the frontalia to be less distinct; the face is longer, more obscured and wrinkled with the bristles situated higher. All tarsi are yellow. Length.—3 mm.

One specimen: Near pond at Peralta, July 7.

PLAGIOPS new genus

Belonging to the group *Psilopini* and closely related to *Discomyza*, *Clanoneurum* and *Peltopsilopa*. It is recognized by the oblique head with the smooth, polished face, which is nearly

straight but oblique in profile, and most prominent at the epistoma. The mesonotum is flattened and the scutellum large and rounded in outline. The mesonotal setulae are arranged in well separated rows. In other characters it is similar to *Psilopa*.

Genotype.—*Plagiops nitidifrons* new species.

Plagiops nitidifrons new species Pl. III, fig. 12.

Black; antennae, apices of tibiae, and all tarsi, pale. Halteres black. Wings yellow, hyaline with bases as far as middle of costal cell and small cross vein and basal third of anal cell blackened; apex of costal cell clear; veins pale. Shining, with frons, face, and abdomen, highly polished and metallic tinged. Mesonotum with transverse micro-rugose sculpturing; scutellum convex, slightly sculptured, broader than long. Length.—2.2 mm.

Type.—♂; Guacimo, Costa Rica, June 6, 1909, [Type No. 6127]. *Paratypes*.—1 ♀ ?, topotypical.

Two more specimens of this species were also collected: Over mud at Peralta, August 7, and at Alajuela, September 15.

ALLOTRICHOMA Becker

1896. *Allotrichoma* Becker, Berl. Ent. Zeit., xli, 121.

This genus is allied to *Discocerina*, but the face is subtuberculate, or rather prominent medianly in form of a subconical, but not noticeably shining, tubercle. This character is not so prominent in the known Costa Rican species, but is quite evident. In some species this tubercle is low, causing the lower portion of the face to become protruding, but there is always an evident recession of the epistoma.

Only the following species is known to occur in Costa Rica.

Allotrichoma abdominalis Williston Pl. III, fig. 6.

1896. *Hecamede abdominalis* Williston, Trans. Ent. Soc. London, 1896, 398.

1897. *Allotrichoma abdominalis* Williston, Kans. Univ. Quart., vi, 4.

A species distinguished by having the face carinated above the tubercle, and the third and fourth abdominal segments conspicuously silvery-white, which, in well preserved specimens, are in strong contrast with the opaque brown basal segments and the mesonotum. Length.—1.5 mm.

Eight specimens collected at Cartago, February 19, and over mud along the Rio de las Cañas, near Santa Cruz, January 30.

ATISSIELLA new genus

Similar to *Atissa*, as based on its type species *Ephydra pygmaea* Haliday, but very distinct in the structure of the face and in the arrangement of the facial bristles.

Face conically prominent, but epistoma retreating; the prominence bearing a pair of stout up curved bristles. There is also a series of two or more down curved bristles below, and a series of dorso-laterally curved hairs along the orbital groove. Wings long, over-reaching the abdomen. Second vein short, so that the third costal section is much longer than the second. Third vein ending in the costa at the pointed apex of the wing.

Genotype: *AtissIELLA setulosa* new species.

AtissIELLA setulosa new species Pl. III, fig. 9.

Black, more or less brown pruinose, slightly shining except the head. Third antennal joint sometimes yellowish below, basally. Halteres yellow. Basal segment of hind tarsi yellowish. Wings immaculate, obscure hyaline.

Mesonotum with a transverse series of six bristles just behind the sutural region. Fifth abdominal segment of male pointed, triangular. Length.—1 mm.

Type.—♂, Cartago, Costa Rica, July 4, 1909, [A. N. S. Type No. 6128]. *Paratypes*.—1 ♂, 1 ♀, Cartago, December 12, 1909, (sweeping over mud); 1 ♂, Juan Viñas, 2600 ft. alt., April 28, 1910, (at brook near woods).

DISCOCERINA

1835. Macquart, Hist. Nat., Dipt., ii, 527.

1844. Stenhammar, Hand. K. Sven. Vet. Akad., 251 (*Clasiopa*).

Allied to *Psilopa*. The structure of the face and the form of the third antennal joint are the best characters for separating the two genera. In this genus the former is usually deeply bifoveolated above, in profile prominent medianly, then evenly retreating to the epistoma, with a series of two or more up-curved, more or less converging bristles each side. Antennae short, third joint hardly ever longer than broad, usually not larger than second; spine of second usually minute. However, most of the species may be distinguished by the opaque, pruinose thorax and irregularly arranged acrostichal setulae. In *Psilopa* the species are more shining; facial foveae weak if developed, face not transversely prominent medianly, and the bristles limited to one on each side.

Table of Costa Rican Species

1. Face seen from above with stripes or series of silvery or white spots 2
Face unicolorous 5
2. Face shining black with two silvery stripes; frons opaque, metallic colored with orbits and preocellar dash velvety black **nana**
Face with three narrow stripes and orbits silvery; frons evenly shining or brownish 3
Facial and frontal orbits silvery; mesofacial area yellowish and separated from orbits by a black stripe **pulchra**
3. Opaque species 4
Shining black species **nitida**
4. Second costal section at least twice as long as third; large species (2.25 mm.). **nepos**
This section at most slightly longer than third; smaller species (1.7 mm.). **trilineata**
5. Fore femora with short spines beneath; cheeks very broad **aenea**
Femora without spines; cheeks narrow 6
6. Opaque species with silvery orbits; abdomen velvety black, with apex conspicuously white or silvery; cheeks narrow **leucoprocta**
Not so colored 7
7. Face with secondary series of minute out-curved bristles; orbits broad and black, silvery **setulosa**
Without secondary series of facial bristles; orbits pale **obscurella**

Discocerina nana Williston

1896. *Discocerina nana* Williston, Trans. Ent. Soc. London, 1896, 396, (St. Vincent).

This pretty species, belonging to a group in which the orbits are conspicuously silvery, is distinguished by the opaque, velvety black frons contrasted with the two greenish or bluish stripes, and the long narrow face with the median area shining black, margined laterally with the narrow silvery orbits. The general color is shining black, with antennae, halteres and tarsi pale.

One specimen; Juan Viñas, April 28, 1910, (at brook near woods).

Discocerina pulchra new species

Black; antennae except apices, palpi, knees, apices of tibiae, and tarsi except apices, pale. Halteres white. Wings hyaline with pale veins.

Frons opaque, brownish with lower orbits silvery. Face opaque, yellowish medianly with shining black, sublateral stripe and broad silvery orbits. Mesonotum subopaque, olivaceous; pleura sparingly grayish. Abdomen shining black. Face with uppermost pair of facial bristles approximate and cruciate, next lower, up-curved mesally, also another series of three to four laterally up-curved bristles. Length.—1.5 mm.

Type.—♂; Turrucare, Costa Rica, December 22, 1909, (sweeping over mud), [Type No. 6129].

Another specimen belonging to this species was collected along a ditch in Cartago, May 25.

Discocerina nitida new species Pl. III, fig. 8.

Black; antennae except apex above, sometimes facial orbits, knees, apices of tibiae, and all tarsi, pale. Halteres white. Wings hyaline with yellow veins.

Shining; upper surfaces sparingly dusted with brown, lower surfaces polished. Face beneath antennae, narrow orbits, a narrow median stripe, and a sub-lateral series of occasionally coalescing spots, silvery. Mesonotum with or without greenish tinge. Abdomen black. Length.—1.5 to 2 mm.

Type.—♂; Guapiles, Costa Rica, June 4, 1909, (creek in forest south of town, 1100 ft. alt.), [Type No. 6130]. *Paratypes*.—3 ♂, 3 ♀, topotypical.

The species is also represented by seven specimens, collected at: Filadelfia, January 18, on the muddy bank of Rio Tempisque, and Juan Viñas, April 28, at a brook near woods.

Discocerina nepos new species

Similar to *trilineata* but larger, not so densely opaque on mesonotum and frons. The latter above the antennae, and the parafacials more distinctly yellowish; the latter extending above and differentiating the frontalia. Median white facial stripes broader, but orbits very narrowly silvery. Prescutellar bristles strong and supra-alars well developed. Knees and tibiae entirely black. Third costal section nearly three times as long as second. Length.—2.25 mm.

Type.—♀; Southern slope of Irazú, near Cartago, Costa Rica, 5000 ft. alt., December 15, 1909, [Type No. 6131].

Discocerina trilineata new species

Black; frons at antennae, antennae inferiorly, parafacials, palpi, knees, apices of tibiae, and tarsi except apices, pale. Halteres white. Wings hyaline with yellow veins.

Opaque; abdomen shining, or brownish pruinose on middle of dorsum; femora and tibiae shining. Frons yellowish brown with lower orbits narrowly silvery; face with three conspicuous, longitudinal, median stripes and narrow orbits, densely silvery; occipital area whitish. Mesonotum and scutellum densely yellowish brown. Length.—1.7 mm.

Type.—♂; Juan Viñas, Costa Rica, April 28, 1910, (at brook near wood, 2600 ft. alt.), [Type No. 6132]. *Paratypes*.—1 ♂, 1 ♀; topotypical.

Discocerina leucoprocta subspecies **incisa** Coquillett

1902. *Discocerina incisa* Coquillett, Journ. N. Y. Ent. Soc., x, 182.

Very similar to the typical form. However, the face is narrower, yellowish with broad, conspicuous silvery orbits, the third and fourth abdominal segments with basal angles cinereous and more or less encroaching on the dorsum. The second and third costal sections subequal.

The typical form, *leucoprocta*, may be distinguished from the other species by the opaque, black abdomen, with the ventral lobes and apical segment silvery white in contrast.

This form is represented by eighty-four specimens from the following localities: Alajuela, September 15; ? Banana River, November 9, (at upper reservoir); Bonnefil Farm, Rio Surubres, October 20; Cartago, July 4 to 27; Filadelfia, January 18, (along muddy beach of Rio Tempisque); Guacimo, June 6; Irazú, South slope near Cartago, December 15, (over mud); Peralta, March 24, (over muddy road), Turrucare, December 22, (over mud); Rio Siquiaries, December 19; Small stream north of Rio Siquiaries, December 20, (over mud); ? Rio Reventazon on Irazú, near Cartago, April 24.

Discocerina setulosa new species Pl. III, fig. 16.

Black; third antennal joint, palpi, apices of femora, fore tibiae, extremities of middle and hind tibiae, and all tarsi, pale. Halteres white. Wings hyaline or grayish with costa and veins black.

Opaque or slightly shining above. Frons, mesonotum and scutellum brown or olivaceous, inclining to ochreous; abdomen slightly so in certain aspects. Narrow frontal and broad facial orbits, and cheeks, silvery; upper part of face, occiput, post-alar spots, pleura, venter and femora, grayish to blackish.

A series of out-curved bristles laterad of the usual facial bristles and divergent with them.

Type.—♂; Filadelfia, Costa Rica, January 18, 1910, (muddy beach of Rio Tempisque), [Type No. 6133]. *Paratype*.—1 ♀; toptotypical.

Discocerina obscurella subspecies **parva** Loew

1862. *Discocerina parva* Loew, Mon. N. Am. Dipt., i, 146.

A race distinguished by the black, evenly dusted face, pale orbits, opaque or semi-opaque mesonotum and frons, and a somewhat contrasting black abdomen, which is generally more or less polished apically.

This form seems to be subject to considerable variation, especially in the color of the legs. The tibiae and femora range from entirely black to almost wholly yellow. The latter seem to simulate a variety I have seen from South America.

One hundred and sixty-eight specimens, which I have credited to this form, were found in the material from the following localities: Alajuela, September 15 to February 19; Quebrada de Salas, Alenas Station, May 8; Cartago, October 10 to February 19; Juan Viñas, May 28; Turrucare, December 19 to 22.

***Discocerina aenea* new species**

This species is placed here provisionally. Some authors may consider it belonging nearer *Athyroglossa glaphyropus* Lw. It probably represents a distinct genus. In general structure it resembles *Discocerina*, especially those species near *nitida*, but the spinose fore femora suggests species placed in *Athyroglossa* and *Ochtheroidea*.

Black; middle and hind tarsi yellow; fore tarsi black; wings hyaline with pale veins. Shining; mesonotum subopaque, minutely granulose and thinly brown dusted. Small spots laterad of, and below, antennae, and two or three on each facia silvery. Meso- and sterno-pleura and abdomen highly polished and metallic tinged.

Face broad, evenly convex on lower part of profile, which convexity is not sharply defined from the foveae. Cheeks linear. Mesonotal setulae numerous, in very close series medianly; no pre-scutellar bristles. Femoral spines minute, in series of about twelve. Length.—2.25 mm.

Type.—♀; Southern slope of Irazú near Cartago, Costa Rica, December 15, 1909, (sweeping over mud), [Type No. 6137].

OCHTHEROIDEA

1896. Williston, Trans. Ent. Soc. London, 1896, 401.

A genus, structurally, not sharply defined from *Athyroglossa* Loew. In fact it seems to be its neotropical representative, although one of its species ranges into the nearctic zone. This genus may, however, be easily distinguished by its entirely shining black species, with the fore femora spinose below and the halteres white. At least these characters hold with the known species. The genus is well represented in Costa Rica, that region having five of the seven known species. The other two, being from adjacent countries, are also included in this paper, but will be more fully treated in my Revision.

Table of Species

1. All tibiae black; fore tarsi white; cheeks very broad.....**centralis**
Fore tibiae alone black.....2
2. Wings clouded on disk and at apex.....**fascipennis**
Wings hyaline or evenly tinged.....3
3. Cheeks at least one-half as high as eyes.....**similis**
Cheeks at most one-third as high as eyes.....4
4. Mesonotum polished.....**laevis**
Mesonotum obscurely shining; wings hyaline.....**glaphyropus**
Mesonotum entirely opaque, granulose; wings tinged with brown; large
species.....**atra**

Ochtheroidea centralis new species Pl. III, fig. 13, 14.

Black; middle and hind tarsi tawny; fore tarsi, except three apical joints, and halteres, white. Wings hyaline with brown veins. Shining, with mesonotum faintly brown dusted.

Face strongly, subconically convex below. Cheeks one-fourth as high as eyes. Length.—2.5 mm.

Type.—♂; Turrucare, Costa Rica, December 20, 1909, (sweeping over mud near small stream north of Rio Siquiares), [Type No. 6136]. *Paratypes*.—2 ♂, 2 ♀; topotypical.

Also represented by a homotypical series of three specimens, from Bonnefil Farm, Rio Surubres, October 20; Alajuela, September 15; Filadelfia, (muddy beach of Rio Tempisque), January 18.

Ochtheroidea fascipennis new species

On account of this species occurring in Colombia I include it here, as it is likely to be found within our limits.

Similar to *centralis*, but more slender. Fore tarsi with only basal joint black, and the middle and hind tibiae yellow. The wings have a discal cloud over posterior cross vein and the apex including tip of marginal cell also infuscate. Length.—2 mm.

Type.—♂; Aracataca, Colombia, February 1912, (Ujhelyi), [Hungarian National Museum]. *Paratypes*.—2 ♂, 1 ♀; topotypical.

Ochtheroidea atra Williston

1896. *Ochtheroidea atra* Williston, Trans. Ent. Soc. London, 1896, 401.

This species was described from St. Vincent, West Indies, and I have a specimen from Panama, so it is likely to occur in Costa Rica.

The mesonotum is densely granulose and therefore opaque. The scutellum is large and flattened, and the wings are tinged with brown. In color it is similar to *centralis*, but slightly larger in size.

Ochtheroidea similis new species

Black; middle and hind tibiae and their tarsi, fore tarsi, except two black apical joints, yellow; halteres white. Wings hyaline with black veins. Shining to nearly polished.

Face more than one-half as broad as vertex, very strongly and rather abruptly convex; facia distinctly transversely wrinkled. Cheeks at least one-half as high as eyes. Mesonotum and scutellum microscopically granulose. Length.—2.5 mm.

Type.—♂; Cachi, Costa Rica, March 7, 1910, (beaches on back channel of Rio Reventazon), [Type No. 6134]. *Paratype*.—1 ♂; topotypical.

Ochtheroidea laevis new species

Similar to *glaphyropus*, but larger. Two apical joints of fore tarsi black. Entirely polished, without any apparent sculpturing. Face one-half as broad as vertex, in profile prominent and convex below. Cheeks one-fifth as high as eyes. Length.—2.5 to 3 mm.

Type.—♂ ?; Alajuela, Costa Rica, September 15, 1909, (sweeping), [Type No. 6135]. *Paratypes*.—4 specimens, topotypical.

Ochtheroidea glaphyropus Loew

1878. *Athyroglossa glaphyropus* Loew, Zeit. f. d. Ges. Naturw., li, 197.

This species has the face and cheeks narrow. The mesonotum is shining although minutely pitted, and the convex scutellum is sometimes nearly scabrous. It will be easily recognized among those with hyaline wings and white fore tarsi. Length.—1.75 mm.

It was described from Texas, but is represented by two specimens in this collection: Bonnefil Farm, Rio Surubres, October 20; Turrucars, Rio Siquiares, December 19.

LYTOGASTER

1896. Becker, Berl. Ent. Zeit., xli, 202.

A genus readily distinguished by the unusually convex, sub-hemispherical abdomen, caused by the shortening of the dorsal part of the second and third segments and elongation of the fourth. The lateral margins are revolute, not sharp and not clos-

ing in on the ventral plates. The second and third segments have a more or less distinct, sunken area on their dorsum. The genus should not be confused with *Gastrops*, which has a prominent subhemi-spherical swelling on the face.

The Costa Rican species may be separated as follows:

Scutellum convex, shining, mesonotum smooth; legs entirely yellow. **pallipes**
 Scutellum flat, more or less opaque; mesonotum sculptured or opaque.

Femora and tibiae black..... **willistoni**
 Legs entirely yellow..... **granulosus**

Lytogaster granulosus Cresson

1914. *Lytogaster granulosus* Cresson, Ent. News, xxv, 249.

Legs entirely yellow, but the scutellum and mesonotum opaque on account of the granulose sculpturing. The abdomen is not so convex as in the other species.

Originally described from Costa Rica.

Represented by 10 specimens from the following localities: In forest near Guapiles, June 4; Near Rio Reventazon at Juan Viñas, June 28; Bonnefil Farm, Rio Surubres, October 20; Upper Reservoir, Banana River, November 9; Beaches on back channel of Rio Reventazon, Cachi, March 7.

Lytogaster willistoni Cresson Pl. III, fig. 18.

1916. *Lytogaster willistoni* Cresson, Ent. News, xxvii, 150.

Distinguished by its black legs and antennae, and unusually convex development of the fourth abdominal segment, which is also distinctly pitted and shining.

Originally described from California.

Represented by five specimens from the following localities: Over mud at Cartago, February 19; Laguna del Dirumbo, southern slope of Irazú, July 13; Over mud on southern slope of Irazú, near Cartago, December 15; Along Brook Toyogres on southern slope of Irazú, April 6.

Lytogaster pallipes Cresson

1914. *Lytogaster pallipes* Cresson, Ent. News, xxv, 248.

A species distinguished by the shining mesonotum and yellow legs. The abdomen is strongly convex as in *willistoni*. It should not be confused with *granulosus*.

Originally described from Costa Rica.

Represented by nineteen specimens: Cartago, October 27 to May 17; Bonnefil Farm, Rio Surubres, October 20; Over mud at Turrucares, December 22; Beaches of back channel of Rio Reventazon at Cachi, March 7; Stagnant pool, bank of Rio Reventazon near Juan Viñas, March 10; Brook Toyogres on southern slope of Irazú, June 6.

GASTROPS

1897. Williston, Kans. Univ. Quart., vi, 3.

This genus is characterized by the subhemispherical protuberance on the median area of the face, and the portion below falling vertically. The scutellum in the known species has two apical tubercles. The abdomen is broad, rather circular in outline, with margins revolute and the surface roughened like a rasp file. In many respects its species suggests *Parydra*.

Only one, the following species is known from Costa Rica.

Gastrops nigra Williston Pl. III, fig. 10.

1897. *Gastrops niger* Williston, Kans. Univ. Quart., vi, 3, (Brazil).

Black, with antennae and tibiae more or less pale. Thorax polished, not dusted or vittate; scutellum convex and wings immaculate.

Twenty specimens collected from the following localities: Stagnant pools on banks of Rio Reventazon, Cachi, March 10; over brook at edge of forest, Juan Viñas, May 3; over mud at small stream north of Rio Siquiares, December 19 to 22.

PSILEPHYDRA

1914. Hendel, Suppl. Ent., iii, 99.

This genus is characterized by the peculiar development of the face, which is large, broadly convex, extending well down, appearing somewhat hemispherical. There are no lines or marks defining the orbital areas, cheeks, foveae and such. There are no characteristic facial bristles, but the entire face is clothed with short, decumbent pile and scattered, suberect hair-like bristles. Its systematic position is apparently somewhere in the Ephyrinae. The following species is the only one known besides its congener from Formosa.

Psilephydra nemorosa Cresson Pl. III, fig. 26.

1914. *Psilephydra nemorosa* Cresson, Ent. News, xxv, 244.

Entirely shining black with faint submetallic lustre, or somewhat obscured by the sparse brown pollen and the granulate or scrobiculated surface, especially of the thorax and scutellum. Face greenish bronze, appearing golden from the dense yellowish microscopic pubescence. Halteres black. Legs black, with joints and all tarsi except apices, yellowish. Wings immaculate, brownish hyaline.

Apical joint of fore tarsi of male dilated, with fan of long hairs; claws long and stout. Length.—1.5 mm.

Described from six specimens collected along forest brook at Juan Viñas, May 1; Río Siquiara, Turrucares, December 19.

NAPAEA

1830. Desvoidy, Myod. 799.

Synonymous with *Parydra* of authors, but at least subgenerically distinct from *Parydra* of Stenhammar as based on its type species *Ephydra aquila* Fallen. I will treat this genus more thoroughly in my Revision. The Costa Rican species, as known to me, are confined to *Napaea* as based on its type species *Ephydra coarctata* Fallen (*Napaea stagnicola* Desv. syn. by Haliday, 1839).

Only the two following species are known to me from Costa Rica.

Napaea humilis Williston

1897. *Parydra humilis* Williston, Kans. Univ. Quart., vi, 7, (South America).

Ocellar bristles well developed. Face brownish, sometimes whitish to golden, gently convex in profile. Posterior dorso-central setulae numerous. Scutellum somewhat narrowed apically; apical bristles with small or minute tubercles. Legs entirely pale. Wings hyaline, without appendages on second vein. Cross veins clouded. Length.—3 mm.

Represented by thirty-one specimens, collected over mud: Cartago, March 1 to May 17; Juan Viñas, February 14; Turrucares, December 22.

Napaea nigripes new species Pl. III, fig. 17.

Similar to *humilis* but smaller, with femora entirely, and tibiae largely, black. The face is shorter, less obscured with pollen; mesonotum with about six posterior dorso-centrals setulae. Scutellum narrower, with the bristles more closely situated, without tubercles. Length.—2 mm.

Type.—♂; Cartago, Costa Rica, February 19, 1910, (sweeping over mud), [Type No. 6138]. *Paratypes*.—3 ♂, 2 ♀; topotypical.

Also represented by a homotypical series of nineteen specimens collected over mud: Cartago, December 12, 1909 to May 17; Southern slope of Irazú, near Cartago, December 15; Rio de las Cañas, near Santa Cruz, January 30; San Isidro, August 21; Toyogres brook near Tierra Blanca, April 6.

OCHTHERA

1802. Latreille, Hist. Nat. Crust. Ins., iii, 462.

The species of this genus are easily recognized by the enlargement of the fore femora, which are greatly dilated and flattened as shown in figure. Only one species is known to occur in Costa Rica, but no doubt others will be found.

Ochthera humilis Williston Pl. III, fig. 25.

1897. *Ochthera humilis* Williston, Kans. Univ. Quart., vi, 6.

Originally described from South America, and easily recognized by the broad, golden yellow face, bearing the shining black tubercle, and the metallic bronze mesonotal stripes.

One specimen collected over grass muddy road at Peralta, March 24.

PLANINASUS

1914. Cresson, Ent. News, xxv, 245.

I have not included this genus in the table, as it is probably not an Ephydrid, but possesses many ephydrid characters and is therefore noted here. The preapical tibial bristles are well developed, as well as are the second basal and anal cells. The dorso-central bristles are in the same series with the prescutellars, and there are two distinct sternopleural bristles. The figure of the head given will help one to recognize the genus. Only the following species is known.

Planinasus ambiguus Cresson Pl. III, fig. 28, 29.

1914. *Planinasus ambiguus* Cresson, Ent. News, xxv, 246, pl. x, f. 5 to 7.

Shining black; lunular area, halteres, coxae, basal half of all femora, bases of fore and hind tarsi, yellow; lower part of the oblique facial plate metallic tinged; lower part of face, when seen from above, pale metallic green. Wings brownish hyaline, immaculate. Length.—3 mm.

Described from a male collected in the Valley of Rio Naranjo, Cachi, March 9.

Subfamily EPHYDRINAE

Of this subfamily there seems to be few species represented in Costa Rica, or even in South America. The species, in contradistinction with those of Notiphilinae, have the frontal bristles curving laterally over the eyes; the median, lower portion of the face is more or less projecting and satulose, with the facial bristles, if differentiated, arranged in series which converge and are sometimes contiguous above, not paralleling the orbits. The oral opening is large and cavernous.

The genera are characterized sufficiently in the tables and will not be further treated here unless deserving special comment.

EPHYDRA

Ephydra rostrata new name Pl. III, fig. 27.

1896. *Ephydra pygmaea* Williston, Tr. Ent. Soc. London, 1896, 402, (xiii, 147-a), nec *Ephydra* (*Atissa*) *pygmaea* Hal., 1833.

This species is not typical of the genus. It may be distinguished by the unusual prolongation of the lower, convex, sparingly bristled part of the face, which in profile is nearly as long beyond the orbits as the diameter of the eye. It is black, with halteres yellow. All upper surfaces, including the face, are shining, metallic tinged, sparingly dusted with brown. Frontal stripes velvety black.

Only one specimen of this species was collected, along a ditch in Cartago, February 10.

SCATELLA

Scatella stagnalis Fallen Pl. III, fig. 22.

1813. *Ephydra stagnalis* Fallen, Act. Holm., 248.

1849. *Scatella stagnalis* Walker, List, iv, 1104.

This species has the face evenly greenish brown; cheeks, pleura and under surfaces not noticeably gray; wings more or less blackened, with clear or white spots as shown in figure. There is a pair of strong acrostical bristles near the suture, but no strong anterior dorso-centrals.

The specimens examined and determined as this species are smaller than those of the nearctic region, and are more shining.

with the wing spots somewhat smaller and rounder, but there seem to be no structural differences.

Twelve specimens collected at Cartago, May 17, to July 4; Rio Reventazon on Irazu, May 24.

Scatella nitidifrons new species Pl. III, fig. 23.

This species has the thickened costa in the male, thus resembling the European *callosicosta* Bezzi, and also a similarly characterized species from the United States.

♂. Black; halteres white; wings hyaline, immaculate. Opaque; frons highly polished; mesonotum posteriorly, scutellum and dorsum of abdomen, shining. Face silvery white at oral margin, to black at antennae. Occiput above, antennae and lateral margins of mesonotum, brownish to olivaceous. Cheeks, pleura, lateral margins of abdomen, venter and legs, gray.

Frons and scutellum flat; the latter triangular, rather narrow apically. Costa noticeably thickened between humeral cross vein and tip of first. Third and fourth veins diverging. Length.—1.75 to 2 mm.

♀. Shining areas not so highly polished; face almost entirely silvery; costa and veins normal

Type.—♂; Cartago, Costa Rica, May 25, 1909, (along ditch), [No. 6139]. *Paratypes*.—4 ♂, 3 ♀, topotypical.

SCATOPHILA

Scatophila variabilis Cresson

1917. *Scatophila variabilis* Cresson, Ent. News, xxviii, 341, 1917.

Represented by two specimens, one of each sex, collected at Cartago, January 3, and July 4. These specimens belong to a variety with a brown face. As I cannot separate these otherwise from the typical specimens with the white face, I consider them conspecific.

BRACHYDEUTERA

Brachydeutera argentata Walker Pl. III, fig. 24.

1853. *Notiphila argentata* Walker, Ins. Saund., iv, 407.

1862. *Brachydeutera dimidiata* Loew, Mon. Dipt. N. A., i, 162.

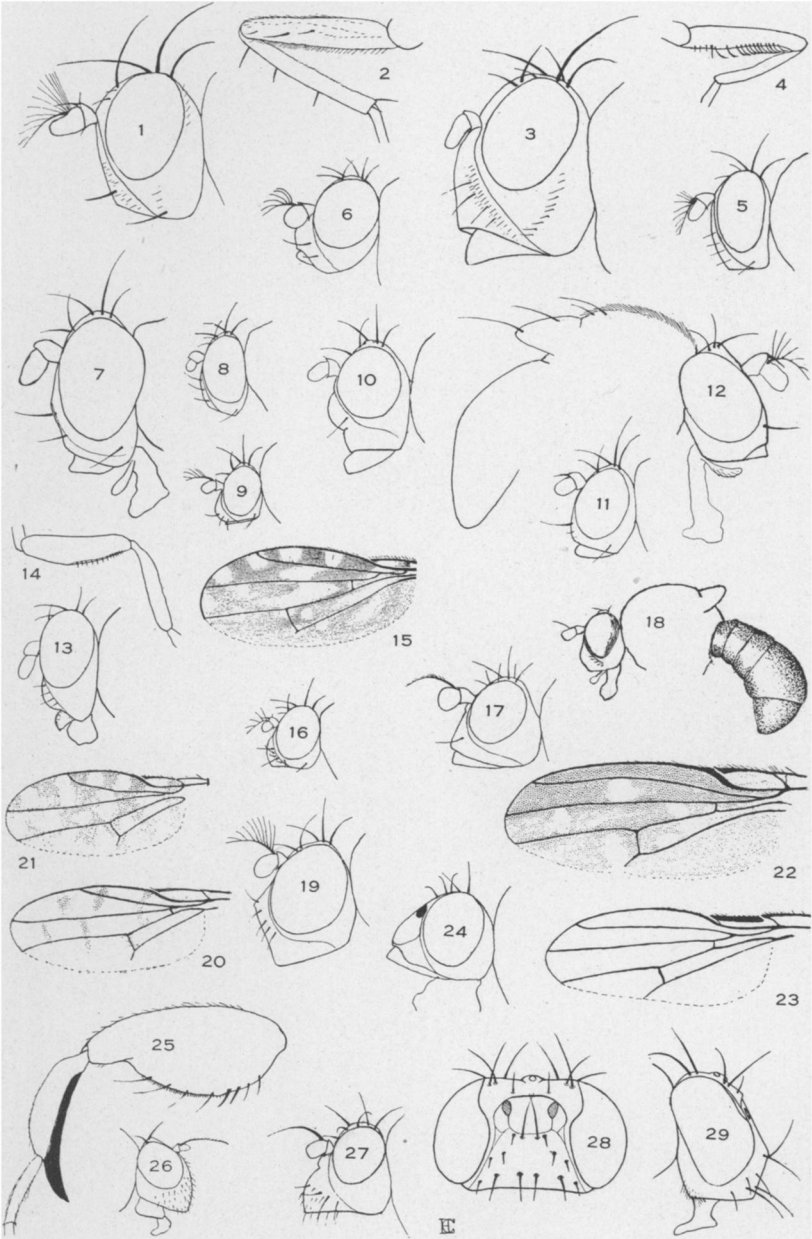
The species of this genus are very unique in the short, projecting face, which is seemingly comprised entirely of the deep foveae and the prominent nose like carina. The clypeus is always prominent. The genus is evidently allied to *Ephydra* but not closely.

The species is always recognized by the dark brown, opaque upper, and contrasting gray lower surfaces, especially of the head and thorax. The legs are pale.

Only one specimen examined from Costa Rica: Over muddy road, Peralta, March 24.

EXPLANATION OF PLATE

- Fig. 1.—*Notiphila erythroceræ*. Profile of head. $\times 20$.
Fig. 2.—*Notiphila erythroceræ*. Middle tibia. $\times 20$.
Fig. 3.—*Paralimna meridionalis*. Profile of head. $\times 20$.
Fig. 4.—*Paralimna ciliata*. Fore femur of male. $\times 20$.
Fig. 5.—*Hydrillia spinicornis*. Profile of head. $\times 20$.
Fig. 6.—*Allotrichoma abdominalis*. Profile of head. $\times 30$.
Fig. 7.—*Typopsilopa flavitarsis*. Profile of head. $\times 25$.
Fig. 8.—*Discocerina nitida*. Profile of head. $\times 20$.
Fig. 9.—*Atissiella setulosa*. Profile of head. $\times 30$.
Fig. 10.—*Gastrops nigra*. Profile of head. $\times 20$.
Fig. 11.—*Psilopa meridionalis*. Profile of head. $\times 20$.
Fig. 12.—*Plagiops nitidifrons*. Profile of head. $\times 25$.
Fig. 13.—*Ochtheroidea centralis*. Profile of head. $\times 25$.
Fig. 14.—*Ochtheroidea centralis*. Fore femur of male. $\times 25$.
Fig. 15.—*Nostima slossonæ*. Wing. $\times 25$.
Fig. 16.—*Discocerina setulosa*. Profile of head. $\times 20$.
Fig. 17.—*Napaea nigripes*. Profile of head. $\times 20$.
Fig. 18.—*Lytogaster willistoni*. Profile of head and abdomen. $\times 15$.
Fig. 19.—*Ilythea flavipes*. Profile of head. $\times 30$.
Fig. 20.—*Ilythea flavipes*. Wing. $\times 15$.
Fig. 21.—*Ilythea fenestralis*. Wing. $\times 15$.
Fig. 22.—*Scatella stagnalis*. Wing. $\times 15$.
Fig. 23.—*Scatella nitidifrons*. Wing. $\times 15$.
Fig. 24.—*Brachydeutera argentata*. Profile of head. $\times 20$.
Fig. 25.—*Ochthera humilis*. Fore femur and tibia. $\times 20$.
Fig. 26.—*Psilephydra nemorosa*. Profile of head. $\times 25$.
Fig. 27.—*Ephydra rostrata*. Profile of head. $\times 20$.
Fig. 28-29.—*Planinasus ambiguus*. Head. $\times 25$.



CRESSON—COSTA RICAN DIPTERA